

WHAT IS CLAIMED IS:

- Sub 217
1. A CDMA receiver for receiving and demodulating a signal including a combined symbol sequence that has a plurality of slots and includes data symbols and pilot symbols, said CDMA receiver comprising:
- means for detecting positions of the pilot symbols in the combined symbol sequence;
- means for generating pilot blocks by extracting in a plurality of slots the pilot symbols from the combined symbol sequence in response to a result of the detection;
- means for obtaining channel estimation values by calculating a weighted sum of average values of the pilot symbols in the pilot blocks;
- means for acquiring from the combined symbol sequence a data symbol sequence in accordance with the result of the detection;
- means for compensating for channel fluctuations of the data symbol sequence using the channel estimation values; and
- means for controlling the weighting in response to a rate of the channel fluctuations.
2. The CDMA receiver as claimed in claim 1, wherein said means for controlling the weighting comprises:

means for compensating for, using the channel estimation values, channel fluctuations of a pilot symbol sequence extracted from the combined symbol sequence;

5 means for generating an error signal from the compensated pilot symbol sequence and an ideal pilot symbol sequence; and

means for carrying out the weighting control using the error signal and the average values of the
10 pilot symbols included in the pilot blocks.

3. The CDMA receiver as claimed in claim 1, wherein said means for controlling the weighting comprises:

means for generating an error signal from the
15 compensated data symbol sequence and from result obtained by demodulating and deciding the compensated data symbol sequence; and

means for carrying out the weighting control using the error signal and the average values of the
20 pilot symbols included in the pilot blocks.

4. The CDMA receiver as claimed in claim 1, wherein said means for controlling the weighting carries out the weighting control using as update values inner
25 products of the channel estimation values of the

data symbols and the average values of the pilot symbols included in the pilot blocks.

a 5. The CDMA receiver as claimed in ^{claim 1} ~~any one of~~
u ~~claims 1-4~~, wherein said CDMA receiver receives a
signal including a combined symbol sequence having a
frame structure consisting of slots in which the
pilot symbols consisting of a few symbols are
inserted into the data symbol sequence at every
10 fixed interval.

a 6. The CDMA receiver as claimed in ^{claim 1} ~~any one of~~
u ~~claims 1-5~~, wherein the pilot blocks are formed from
all the pilot symbols in a slot.

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a 7. The CDMA receiver as claimed in ^{claim 1} ~~any one of~~
u ~~claims 1-6~~, wherein when obtaining the channel
estimation value of a data symbol in an n-th slot of
the combined symbol sequence, where n is an integer,
20 the pilot blocks are generated from an (n-K+1)-th
slot to an (n+K)-th slot of the combined symbol
sequence, where K is a natural number.

8. A CDMA receiver for receiving and demodulating a
25 signal including a data symbol sequence and a pilot

symbol sequence parallel to the data symbol
sequence, said CDMA receiver comprising:

means for generating a plurality of pilot blocks
from the pilot symbol sequence;

5 means for obtaining channel estimation values by
calculating a weighted sum of average values of the
pilot symbols in the pilot blocks;

means for compensating for channel fluctuations
of the data symbol sequence using the channel
10 estimation values; and

means for controlling the weighting in response
to a rate of the channel fluctuations.

9. The CDMA receiver as claimed in claim 8, wherein
15 said means for controlling the weighting comprises:

means for compensating for, using the channel
estimation values, channel fluctuations of the pilot
symbol sequence;

means for generating an error signal from the
20 compensated pilot symbol sequence and an ideal pilot
symbol sequence; and

means for carrying out the weighting control
using the error signal and the average values of the
pilot symbols included in the pilot blocks.

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10. The CDMA receiver as claimed in claim 8,
wherein said means for controlling the weighting
comprises:

means for generating an error signal from the
5 compensated data symbol sequence and from result
obtained by demodulating and deciding the
compensated data symbol sequence; and

means for carrying out the weighting control
using the error signal and the average values of the
10 pilot symbols included in the pilot blocks.

11. The CDMA receiver as claimed in claim 8,
wherein said means for controlling the weighting
carries out the weighting control using as update
15 values inner products of the channel estimation
values of the data symbols and the average values of
the pilot symbols included in the pilot blocks.

claim 8
12. The CDMA receiver as claimed in ~~any one of~~
20 ~~claims 8-11~~, wherein said CDMA receiver receives a
signal including a data symbol sequence which is
spread using a first spreading code, and a pilot
symbol sequence which is parallel to the data symbol
sequence and spread using a second spreading code,
25 the first spreading code and the second spreading
code being orthogonal to each other.

claim 8
a 13. The CDMA receiver as claimed in ~~any one of~~
~~claims 8-12~~, wherein said CDMA receiver receives a
signal including a spread data symbol sequence which
5 is impressed on a first carrier, and a spread pilot
symbol sequence which is parallel to the data symbol
sequence and is impressed on a second carrier, the
first carrier and the second carrier being
orthogonal to each other.

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claim 8
a 14. The CDMA receiver as claimed in ~~any one of~~
~~claims 8-13~~, wherein when obtaining the channel
estimation value of an n-th data symbol in the data
symbol sequence, where n is an integer, the
15 plurality of pilot blocks are generated from an (n-
K+1)-th pilot symbol to an (n+K)-th pilot symbol in
the pilot symbol sequence, where K is a natural
number.

claim 8
20 a 15. The CDMA receiver as claimed in ~~any one of~~
~~claims 8-14~~, wherein the plurality of pilot blocks
have a same length.

16. A CDMA transceiver including a transmitting
25 section for transmitting a signal including a
combined symbol sequence that has a plurality of

slots and includes data symbols and pilot symbols,
and a receiving section for receiving and
demodulating the signal, said receiving section
comprising:

5 means for detecting positions of the pilot
symbols in the combined symbol sequence;

means for generating pilot blocks by extracting,
in a plurality of slots, the pilot symbols from the
combined symbol sequence in response to a result of
10 the detection;

means for obtaining channel estimation values by
calculating a weighted sum of average values of the
pilot symbols included in the pilot blocks;

means for acquiring from the combined symbol
15 sequence a data symbol sequence in accordance with
the result of the detection;

means for compensating for channel fluctuations
of the data symbol sequence using the channel
estimation values; and

20 means for controlling the weighting in response
to a rate of the channel fluctuations.

17. A CDMA transceiver including a transmitting
section for transmitting a signal including a data
25 symbol sequence and a pilot symbol sequence parallel
to the data symbol sequence, and a receiving section

for receiving and demodulating the signal, said receiving section comprising:

means for generating a plurality of pilot blocks from the pilot symbol sequence;

5 means for obtaining channel estimation values by calculating a weighted sum of average values of the pilot symbols in the pilot blocks;

means for compensating for channel fluctuations of the data symbol sequence using the channel
10 estimation values; and

means for controlling the weighting in response to a rate of the channel fluctuations.

18. A CDMA receiving method of receiving and
15 demodulating a signal including a combined symbol sequence that has a plurality of slots and includes data symbols and pilot symbols, said CDMA receiving method comprising the steps of:

detecting positions of the pilot symbols in the
20 combined symbol sequence;

generating pilot blocks by extracting, in a plurality of slots, the pilot symbols from the combined symbol sequence in response to a result of the detection;

obtaining channel estimation values by
calculating a weighted sum of average values of the
pilot symbols in the pilot blocks;

acquiring from the combined symbol sequence a
5 data symbol sequence in accordance with the result
of the detection; and

compensating for channel fluctuations of the
data symbol sequence using the channel estimation
value,

10 wherein the weighting is controlled in response
to a rate of the channel fluctuations.

19. A CDMA receiving method of receiving and
demodulating a signal including a data symbol
15 sequence and a pilot symbol sequence parallel to the
data symbol sequence, said CDMA receiving method
comprising the steps of:

generating a plurality of pilot blocks from the
pilot symbol sequence;

20 obtaining channel estimation values by
calculating a weighted sum of average values of the
pilot symbols in the pilot blocks; and

compensating for channel fluctuations of the
data symbol sequence using the channel estimation
25 value,

wherein the weighting is controlled in response
to a rate of the channel fluctuations.

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